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ABSTRACT

A total of 36 normally developing children of 13-30 months of age were evenly divided into three age groups and observed while playing with their mothers. Their communicative behaviors were recorded according to intent and level. Intent was classified as comment, request, and reject; levels were nonverbal, verbal-contextual, and verbal-decontextual. Findings were examined for an interaction of sex and age of subject with frequency of each intent at each level. There was a significant age x intent x level interaction. Rejects occurred significantly less often than either comments or requests, which did not differ significantly. A follow-up tally indicated that decontextual utterances by children were infrequent, as were maternal decontextual utterances. This finding appeared to be a function of the play materials. Implications for the use of low-structured observation are discussed. (Author/RH)

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Use of Low Structured Observation for Assessing Communicative Intents in Young Children

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ABSTRACT

Thirty-six normally developing children (18 boys and 18 girls), evenly divided into three age groups from 13-30 months of age, were observed while playing with their mothers. Their communicative behaviors were recorded according to intent (comment, request, reject) and level (non-verbal, verbal-contextual and verbal-decontextual). The results were examined for an interaction of sex and age of subject with frequency of each intent at each level. There was a significant age x intent x level interaction. Rejects occurred significantly less often than either comments or requests, which did not differ significantly. Decontextual utterances by children were infrequent, as were maternal decontextual utterances in a follow-up tally. This finding appeared to be a function of the play materials. Implications for the use of low structured observation are discussed.

Use of Low Structured Observations for Assessing Communicative Intents in Young Children

Young children appear to develop communicative intent by the end of their first year, prior to the onset of speech (Bates, Camaioni & Volterra, 1975; Sugarman, 1984). Intent to communicate is inferred from coordinated person-object or triadic interactions (Bakeman & Adamson, 1984; Dunst, 1985; Sugarman, 1984). In these interactions, the child appears to indicate what action or reaction is expected of the person regarding the object of interest (Sugarman, 1984). The message is indicated nonverbally by vocalizations and conventional gestures (e.g., showing, giving, or pointing to the object) while looking at the other person (Chapman, 1981; Harding, 1983).

Specific categories of communication intent have been distinquished in children's nonverbal behavior (Chapman, 1981). Children reject offered objects and activities, request objects or actions on objects, and comment on objects in order to direct the other person's attention to them. These communication intents are eventually expressed verbally, first in reference to people, objects, and events in the immediate context and later in reference to entities displaced in time and space (Olszewski & Fuson, 1986; Sachs, 1983). The increasing ability of children to talk about non-perceptually present entities is referred to as decontextualization (Bates, 1979). Olszewski and Fuson (1986) observed that decontextualized talk is initially prompted by physically present objects, which serve as an "impetus to remind" the child of displaced situations and events surrounding those

objects (p. 226). Later conversations are based totally on mental representations of people, objects, and events (Olszewski & Fuson, 1986).

A number of methods have been developed for assessing communication intentions in children (Casby & Cumpata, 1986; Coggins & Carpenter, 1981; Coggins, Olswang & Guthrie, 1987; Holdgrafer, Kysela & McCarthy, 1989; Snyder, 1978). The specific methods involve either low structured observation or structured elicitation tasks. Coggins et al. (1987) review the assets and liabilities of both methods. The nonobtrusive nature of low structured observations presumably results in a representative sample of the child's behavior. However, behavior varies as a function of context and the child may have insufficient opportunities to demonstrate specific intentions. Structured elicitation tasks increase the probability that a desired intention will occur, but the contrived nature of the context may jeopardize the representativeness of the sample.

Coggins et al. (1987) compared young children's use of requests and comments during low structured play tasks and structured elicitation tasks in a 15-month, longitudinal study. Communicative intents could be expressed either nonverbally or verbally. The data were analyzed according to the number of subjects meeting criterion for requesting and commenting in each condition at three-month intervals from 9 to 24 months of age. A child was credited with the ability to comment or request if three or more occurrences of these behaviors were observed in a session. In the elicitation task more children met criterion for

requesting than commenting until 24 months, with the greatest difference evident at 15 and 18 months. In the low structured task substantially more children met criterion for commenting than requesting, regardless of age. Coggins et al. (1987) suggest that the children commented more during low structured observation because the nonobstrusive nature of the task allowed them to attend to those objects, actions and events that they found interesting. Also, there were apparently few opportunities for children to produce requests.

Awareness of the assets and liabilities of assessment procedures is important in making informed decisions about the adequacy of a child's communicative competence (Dollaghan & Miller, 1986; Siegel & Broen, 1976). Observational methods are used extensively in the study of communicative development and disorders yet they have recieved little scrutiny (Dollaghan & Miller, 1986). Coggins et al. (1987) conclude that low structured observation is an efficient method for determining a child's ability to produce comments but not requests. Furthermore, low structured observations have yielded low frequencies of rejecting (Coggins & Carpenter, 1981) probably due to maternal avoidance of situations that would otherwise provide an opportunity for a child to express that intention (Carpenter, Mastergeorge & Coggins, 1985).

The present study provides further evaluation of the efficacy of low structured observation for assessing young children's productions of comments, requests, and rejects. The study extends the above research by examining the interaction of

sex and age of subjects with the frequency of each intent at nonverbal (triadic), verbal-contextual, and verbal-decontextual developmental levels of intentional communication (Dunst, 1985; Holdgrafer & Dunst, 1986). The predicted outcome was comments > requests > rejects, based on the research reviewed above.

METHOD

Subjects

Thirty-six normally-developing children, 18 boys and 18 girls served as subjects. They were part of a larger, cross sectional study of communication development of children from birth to 30 months. There was a boy and girl in each of 18 one-month age intervals from 13 to 30 months. Three age groups were formed, each spanning six months (13-18, 19-24, 25-30). There were 12 subjects (6 female, 6 male) in each group.

Subjects were obtained by posting advertisements in public health centres in Edmonton, Alberta. Public health centres provide extensive services to families with young children, including routine immunizations, health and developmental assessments, and family counseling on child growth, development, nutrition and safety, as well as on parenting. Ninety-five percent of the children born in Edmonton participate in these clinics. Each subject passed the Denver Developmental Screening Test (Frankenburg & Dodds, 1967) administered by public health centre personnel. Virtually all of the parents who agreed to participate in the study had completed high school and a majority had a university degree. All children were considered to be from middle class homes.

General Procedures

Each mother and child were observed unobtrusively for one 20-minute play session. The play sessions were conducted at the University of Alberta in a research laboratory with an adjoining observation booth. A box of toys was provided (Appendix A). At the beginning of the session the experimenter instructed each mother to play with her child as she would at home, using the toys in any manner that was comfortable for her. The session was videotape recorded through a observation mirror. Each videotape was time-coded. A trained observer, using the definitions in Table 1, watched each videotape and recorded communicative behaviors on a protocal form according to level and intent and also indicated the time of occurrence.

Insert Table 1

Reliability

A second observer (GH) independently scored the videotapes of eight of the 36 subjects. The eight subjects spanned the 13 to 30 month age range. Time of occurrence for each communicative behavior allowed for the determination of point to point reliability (McReynolds & Kearns, 1986). The two observers' records were compared on a behavior by behavior basis. The total number of agreements for the eight subjects was divided by the total number of agreements and disagreements and multiplied by 100. Table 2 contains the percentages of agreement for the recording of communicative behaviors according to level and intent. There were no occurrences of triadic and verbal-

decontextual rejects on either observer's record and only a few verbal-contextual rejects. There were also no occurrences of decontextualized requests and only a few decontextualized comments. As will be seen later, rejects and decontextualized language were very infrequent in the entire sample of 36 subjects. Observer agreement for communicative behaviors occurring in the eight samples ranged from 82% to 100%.

Insert Table 2

RESULTS

The data were analyzed statistically using SPSSx programs. Table 3 contains the cell means and standard deviations according to sex and age of subjects and level and intent of communicative behavior. Lack of homogeneity of variance is indicated by the substantially different standard deviations and is confirmed by the Cochran Test ($p < .0001$). Consequently, the data were transformed using the Box-Cox transformation in order to maximize the fit between the observed and the normal distribution.

Insert Table 3

The transformed data were evaluated using a four way analysis of variance with repeated measures. An experiment-wise alpha of 0.05 was selected as the criterion for statistical significance. Table 4 provides a summary of the analysis of variance. Among the significant findings, there was an interaction of age, communicative intent, and level.

Insert Table 4

The nature of that interaction was the a priori question of the study. A Bonferroni analysis was carried out on the interaction. It involved a series of one-tailed, least squared difference tests with an alpha level of 0.05 split among 27 planned comparisons. Comparisons were made among intents within each level and age group. Table 5 presents the 27 comparisons. A difference of 0.36 (dF = 179.90) was required for statistical significance.

Insert Table 5

At the triadic level, the results were consistent across age groups. There were significantly more requests and comments than rejects but there were no significant differences between comments and requests. Similar results occurred at the verbal-contextual level except that there was no significant difference between rejects and requests in the 13-18 month age group. At the verbal-decontextual level the results were more dissimiliar, however, decontextualized utterances occurred infrequently. There were no significant differences among intents in the 13-18 month group. In the 19-24 month group there were significantly more comments than requests and rejects but there was no difference between the latter two intents. In the 25-30 month group there were significantly more comments than rejects but no significant differences between either rejects and comments or requests and comments.

Figure 1 illustrates the frequency of use of each communicative level by age of subjects. Each data point is the average frequency for the female and male subject at each one month interval. As age increased, there was a gradual decrease in triadic communication and a marked increase in verbal-contextual communication. Verbal-decontextual communication began to appear at 18 months of age but remained very low in frequency (except for one child at 30 months of age). Children from 24-30 months should exhibit more decontextualized language (Olszewski & Fuson, 1986). Given that mothers can promote decontextualized child talk by introducing displaced topics (Lucariello, Kyratzis & Engel, 1986), the videotapes were scored by a trained observer, using the definitions in Table 1, for the frequency of maternal verbal-contextual and verbal-decontextual talk. The average number and percentage of decontextualized utterances spoken by the two mothers at each one month age interval are presented in Figure 2. There was some variability in number of maternal decontextualized utterances, but the percentage was typically 5% or less.

Insert Figures 1 and 2

DISCUSSION

The results provide only partial support for the original prediction of the study. Typically, low structured observation yielded significantly fewer rejects than comments and requests, as predicted from the research of Coggins and Carpenter (1981), but comments and requests did not differ significantly. A significant difference between the latter two intents was

predicted from the research of Coggins et al. (1987).

Coggins et al. (1987) observed that the majority of their subjects met the performance criterion of three or more comments in low structured observation by their first birthday, but they very seldom produced requests at any age. More than 90% of their 35 subjects at 18, 21, and 24 months commented three or more times. In the present cross-sectional study, 97% and 92% of the 36 subjects met that performance criterion for comments and requests, respectively, but they very seldom produced rejects. The subjects in the two studies differed somewhat. Those in the present study were from middle class homes of well educated parents whereas Coggins et al. (1987) randomly selected subjects from newspaper birth announcements to ensure a variety in socioeconomic sampling.

The play materials utilized in the two studies is an important consideration. A number of the toys used in the present study (e.g., bubble bottle with screw-on lid and mechanical toys) are similar to the toys used successfully by Coggins et al. (1987) in their elicitation condition involving requests for adult assistance. Inclusion of those toys in the low structured observation provided the opportunities for requests that were apparently lacking in the play materials used by Coggins et al. (1987) in their low structured play condition. Lack of opportunities for producing requests lead them to conclude that low structured observation appears to be an inefficient method for obtaining requests from young children.

The low frequency of verbal-decontextual utterances by

mothers and children supports the argument that the common practice of using a set of attractive toys in low structured observation focuses the dyad on the immediate context rather than on displaced topics (Wanska & Bedrosian, 1986). Play involving routine events (e.g., dressing, eating) may promote decontextualized talk by mother and child because of shared event knowledge or "event representation" that includes situationally appropriate entities and activities not part of the immediate context (Lucariello, Kyratizis & Engel, 1986:139). Furthermore, low structured observation involving no play material may further promote mother-child conversation about displaced topics (Bedrosian & Willis, 1984; cited by Wanska & Bedrosian, 1986) that must be based totally on mental representation.

Dollaghan and Miller (1986) state that improving our understanding and implementation of observational methods will improve the quality of assessment of communicative competence. Not surprisingly, the available research on the efficacy of low structured observation demonstrates that communicative behavior varies as a function of the characteristics of the observational situation. The clinician or investigator can arrange observational situations to obtain information primarily about a child's ability to comment (Coggins et al. 1987), to comment and request primarily in reference to the immediate context (present study), and to talk about displaced topics, either prompted by objects in the immediate context (Lucariello et al., 1986) or based totally on mental representation (Bedrosian & Willis, 1984). Low structured observation appears to be an inefficient

method for obtaining rejects from children, necessitating the use of elicitation tasks and/or parental report. However, incorporation of potentially non-preferrable, as well as preferrable stimulus materials (Olswang, Bain, Dunn & Cooper, 1983) into the observational situation might increase the opportunities for production of rejects. It seems clear that low structured observation will be most efficacious as a method for assessing the communicative competence of young children if, as argued by Dollaghan and Miller (1986), the clinician or investigator carefully specifies both the information to be obtained and the appropriate characteristics of the situation in which the observation will occur.

REFERENCES

Bakeman, R. & Adamson, L. B. (1984). Coordinating attention to people and objects in mother-infant and peer-infant interaction. Child Development, 55, 1278-1289.

Bates, E. (1979). The Emergence of Symbols (New York: Academic Press).

Bates, E., Camaioni, L. & Volterra, V. (1975). The acquisition of performatives prior to speech. Merrill-Palmer Quarterly, 21, 205-226.

Bedrosian, J. L. & Willis, T. L. (1984). Effects of intervention on a school-aged child's topic performance. Paper present at the annual meeting of the American Speech-Language-Hearing Association, San Francisco, California.

Carpenter, R. L., Mastergeorge, A. M. & Coggins, T. E. (1983). The acquisition of communicative intentions in infants eight to fifteen months of age. Language and Speech, 26, 101-115.

Casby, M. W. & Cumpata, J. F. (1986). A protocal for the assessment of prelinguistic intentional communication. Journal of Communication Disorders, 19, 251-260.

Chapman, R. S. (1981). Exploring children's communicative intents. In J. Miller (Ed.), Assessing Language Production in Children (Austin, TX: PRO-ED).

Coggins, T. E. & Carpenter, R. L. (1981). The communicative intention inventory: A system for observing and coding children's early intentional communication. Applied Psycholinguistics, 3, 235-252.

Coggins, T. E., Olswang, L. B. & Guthrie, J. (1987). Assessing communicative intents in young children: Low structured observation or elicitation tasks? Journal of Speech and Hearing Disorders, 52, 44-49.

Dollaghan, C. & Miller, J. F. (1986). Observational methods in the study of communicative competence. In R. Schiefelbusch (Ed.), Language Competence: Assessment and Intervention (San Diego: College-Hill Press).

Dunst, C. J. (1985). Communicative competence and deficits: Effects on early social interactions. In E. McDonald & D. Gallagher (Eds.), Facilitating Social-Emotional Development in the Young Multiply Handicapped Child (Philadelphia: HMS Press).

Frankenburg, W. K. & Dodds, J. B. (1967). The Denver Developmental Screening Test. Journal of Pediatrics, 71, 181-191.

Harding, C. G. (1983). Setting the stage for language ~~acquisition: Communication de~~velopment in the first year. In R. Golinkoff (Ed.), The Transition from Prelinguistic to Linguistic Communication (Hillsdale, NJ: Erlbaum).

Holdgrafer, G. E. & Dunst, C. J. (1986). Communicative competence: From research to practice. Topics in Early Childhood Special Education, 6, 1-22.

Holdgrafer, G. E., Kysela, G. K. & McCarthy, C. (1989). Joint action intervention and child language skills: A research note. First Language, in press.

Lucariello, J., Kyratzis, A. & Engel, S. (1986). Event representations, context, and language. In K. Nelson (Ed.), Event Knowledge: Structure and Function in Development (Hillsdale, NJ: Lawrence Erlbaum Associates).

McReynolds, L. V. & Kearns, K. P. (1983). Single Subject Experimental Designs in Communicative Disorders (Baltimore: University Park Press).

Olszewski, P. & Fuson, K. C. (1986). Preschoolers' dyadic speech about nonpresent entities during joint play. Discourse Processes, 9, 221-233.

Olswang, L., Bain, B., Dunn, C. & Cooper, J. (1983). The effects of stimulus variation on lexical learning. Journal of Speech and Hearing Disorders, 48, 192-201.

Sachs, J. (1983). Talking about the there and then: The emergence of displaced reference in parent-child discourse. In K. E. Nelson (Ed.), Children's Language, (Hillsdale, NJ: Lawrence Earlbaum Associates).

Siegel, G. M. & Broen, P. A. (1976). Language assessment. In L. Lloyd (Ed.), Communication Assessment and Intervention Strategies (Baltimore: University Park Press).

Snyder, L. (1978). Communicative and cognitive abilities in the sensorimotor period. Merrill-Palmer Quarterly, 24, 161-180.

Sugarman, S. (1984). The development of preverbal communication: Its contribution and limits in promoting the development of language. In R. Schiefelbusch and J. Pickar (Eds.), The Acquisition of Communicative Competence (University Park Press: Baltimore).

Wanska, S. K. & Bedrosian, J. L. (1986). Topic and communicative intent in mother-child discourse. Journal of Child Language, 13, 523-536.

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APPENDIX A

string activated See & Say
clear plastic ball containing a butterfly
sull toy train engine
toy accordian
two plastic telephones
squeeze toy animals
clanking clowns
form box
large toy car
dump ruck
wind-up radio
drum with built-in xylophone
tamborine
button operated toy clock
pop beads
rubber ball
rattles
windup animal toys
plastic dog
spinning top
button operated hippo
jack-in-the-box
plastic bubble bottle with screw-on lid

Table 1. Communicative levels, intents, and example behaviors

---

I. Triadic Communication. These communicative acts are intentionally used, socially recognized, and culturally defined non-verbal behaviors that involve the child's use of an adult as an intervening agent to obtain a desired object or the use of an object to operate on adult attention.

A. Rejects. The adult initiates or attempts to maintain an interaction by offering the child some object. The child attempts to terminate the interaction gesturally and/or vocally (e.g., child looks at adult, vocalizes in an angry voice, and uses a ridding gesture such as pushing or swiping the object away).

B. Requests. The child initiates or attempts to maintain an interaction by indicating gesturally and/or vocally, a desire for the adult to provide a particular object or to perform an action on an object (e.g., child looks at adult, points to object, and vocalizes in a persistent manner). The child clearly waits for a response to the request (Coggins & Carpenter, 1981).

C. Comments. The child initiates or attempts to maintain an interaction by indicating gesturally and/or vocally a desire for the adult to attend to an object that the child has noticed (e.g., child looks at adult, vocalizes, and gives object to the adult). There is no waiting for a response. The child typically continues to play with the object after obtaining the adult's attention or may turn to another object.

II. Verbal-Contextual (C) Communication. These communicative acts are socially recognized and culturally defined words (and word combinations) used to express communicative intentions about perceptually present persons, objects, and events.

A. Rejects. The adult initiates or attempts to maintain an interaction which the child attempts to terminate verbally (e.g., child uses the word "no").

B. Requests. The child initiates or attempts to maintain an interaction by indicating verbally, a desire for the adult to provide objects or actions on objects. The child waits for a response to the request (e.g., child may name an object, action or person to perform the action, or a concept related to object such as "more" or an internal state such as "want").

C. Comments. The child initiates or attempts to maintain an interaction by indicating verbally, a desire for the adult to attend to the child's interests. There is no waiting for a response other than the adult's attention (e.g., child may name an object, action, or person, or some internal state or experience such as "scared" or concept related to an object such as "hot").

III. Verbal-Decontextual (D) Communication. These communicative acts are socially recognized and culturally defined words (and word combinations) that are used to express communication intentions about people, objects, and events displaced in time and space. Decontextual communication acts may be prompted by perceptually present stimuli or have no perceptually present referent (Olszewski & Fuson, 1986). The definitions of communication intentions and behaviors are the same as above.

Table 2. Percentages of observer agreement by level and intent

Levels	Intents		
	Reject	Request	Comment
Triadic	-	96	88
Verbal-C	100	82	88
Verbal-D	-	-	100

Table 3. Cell means and standard deviations

Sex	Age	Levels	Rejects	Intents Requests	Comments
M	13-18	Triadic	0.33	4.17	4.33
			(0.82)	(5.34)	(2.73)
		Verbal-C	0.00	0.67	5.00
			(0.00)	(1.21)	(9.88)
		Verbal-D	0.00	0.00	0.00
			(0.00)	(0.00)	(0.00)
F	13-18	Triadic	0.17	7.83	9.67
			(0.41)	(4.40)	(9.40)
		Verbal-C	0.33	2.83	5.83
			(0.82)	(3.49)	(6.49)
		Verbal-D	0.00	0.17	0.17
			(0.00)	(0.41)	(0.41)
M	19-24	Triadic	0.17	2.83	3.50
			(0.41)	(2.64)	(2.26)
		Verbal-C	1.50	7.83	33.33
			(2.51)	(4.62)	(28.68)
		Verbal-D	0.00	0.00	0.83
			(0.00)	(0.00)	(1.33)
F	19-24	Triadic	0.17	1.83	4.00
			(0.41)	(2.79)	(5.51)
		Verbal-C	1.67	13.17	26.00
			(2.58)	(11.92)	(17.62)
		Verbal-D	0.00	0.00	1.17
			(0.00)	(0.00)	(1.17)
M	25-30	Triadic	0.00	1.34	2.34
			(0.00)	(1.51)	(3.01)
		Verbal-C	0.83	12.83	29.00
			(1.17)	(7.96)	(9.34)
		Verbal-D	0.00	0.67	0.50
			(0.00)	(1.21)	(0.84)
F	25-30	Triadic	0.00	0.83	1.33
			(0.00)	(0.98)	(2.42)
		Verbal-C	2.83	24.67	40.17
			(3.97)	(14.42)	(13.35)
		Verbal-D	0.17	0.67	7.00
			(0.41)	(1.21)	(10.04)

Table 4 Results of four-way analysis of variance

Source of Variation	MSH	MSE	F-Ratio	DFH	DFE	PROB
Between Subjects:						
Sex	0.26	0.12	2.21	1.0	30.0	0.1478
Age	0.80	0.12	6.86	2.0	30.0	0.0035*
Sex x Age	0.33	0.12	2.80	2.0	30.0	0.0765
Within Subjects:						
Level	9.21	0.14	66.05	1.9	56.1	0.0001*
Sex x Level	0.23	0.14	1.63	1.9	56.1	0.2060
Age x Level	2.35	0.14	16.83	3.7	56.1	0.0001*
Sex x Age x Level	0.15	0.14	1.08	3.7	56.1	0.3744
Intent	9.00	0.09	96.50	1.8	55.5	0.0001*
Sex x Intent	0.06	0.09	0.06	1.8	55.5	0.9267
Age x Intent	0.07	0.09	0.72	3.7	55.5	0.5708
Sex x Age x Intent	0.09	0.09	1.02	3.7	55.5	0.4030
Level x Intent	0.83	0.09	9.39	3.2	95.0	0.0001*
Sex x Level x Intent	0.13	0.09	1.44	3.2	95.0	0.2355
Age x Level x Intent	0.23	0.09	2.62	6.3	95.0	0.0196*
Sex x Age x Level x Intent	0.06	0.09	0.71	6.3	95.0	0.6509

*p< .05

Table 5. Multiple comparisons involving age, level and intent

Age	Levels	Comparison		
		Rej./Req.	Rej./Com.	Req./Com.
	Triadic			
13-18		0.73*	0.86*	0.12
19-24		0.47*	0.61*	0.14
25-30		0.41*	0.43*	0.02
	Verbal-C			
13-18		0.31	0.56*	0.25
19-24		0.66*	0.89*	0.23
25-30		0.74*	0.85*	0.11
	Verbal-D			
13-18		0.05	0.00	0.00
19-24		0.00	0.37*	0.37*
25-30		0.19	0.46*	0.27

*p< .002

Figure 1.Communicative Level and Age

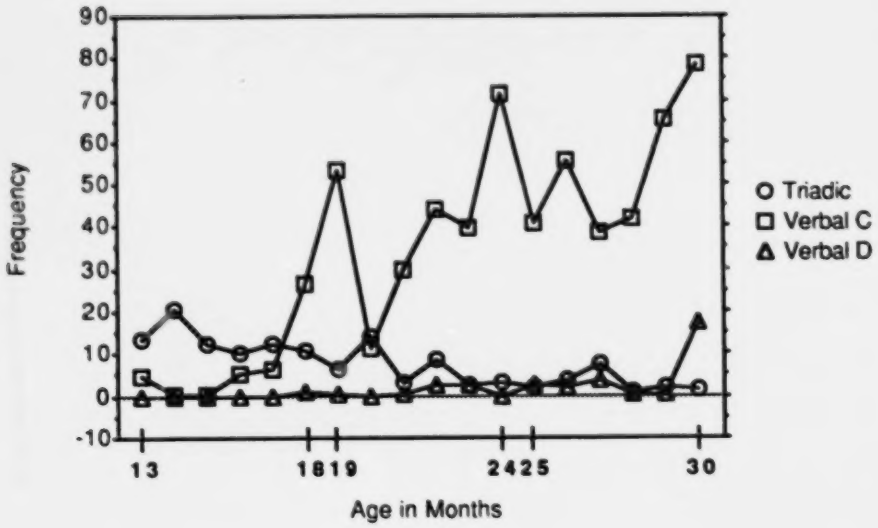

Figure 2. Number and percentage of maternal decontextualized utterances